MINUTES OF THE JUNE 18-19, 1998 DRINKING WATER COMMITTEE MEETING

U.S. Environmental Protection Agency, Science Advisory Board
Drinking Water Committee
June 18-19, 1998
Washington, DC 20460

F:\USER\PTHOMAS\DOCS\INTERNET\MINUTES\99MINUTE\DWMIN698.DFT

MINUTES OF MEETING: June 18 - 19, 1998

PURPOSE: The purpose of the meeting was to interact with EPA personnel on the following topics:

1) program updates from senior managers from the Office of Groundwater and Drinking Water/OW, the Office of Science and Technology, and the Office of Research and Development,
2) drinking water research conducted under EPA's STAR program,
3) the agency's final *Research Plan for Microbial Pathogens and Disinfection By-Products in Drinking Water,* receive information on the agency's M/DBP Research Tracking System,
4) alternative test systems for disinfection byproduct testing,
5) the EPA drinking water contaminant occurrence data base,
6) the NCEA-Cincinnatti comparative risk framework,
7) affordability criteria for technologies for small systems, and
8) drinking water intake levels.

LOCATION: The meeting was held in Room 3709 of the Environmental Protection Agency Headquarters, 401 M Street, S.W., Washington, D.C 20007 and was announced in the *Federal Register* on June 2, 1998 (Vol. 63, No. 105, page 29992 (Attachment A).

PARTICIPANTS: SAB Members and Staff: Drs. Richard Bull (Chairman), Lenore Clesceri, Mary Davis, Yvonne Dragan, John Evans, Anna Fan, Christine Moe, Edo Pellizzari, Verne Ray, Gary Toranzos, Rhodes Trussell, and Marylynn Yates. Drs. Judy Bean, Charles O'Melia, and L.D. McMullen were unable to attend this meeting. Staff present included Mr. Thomas O. Miller, Designated Federal Officer (DFO) and Executive Secretary to the DWC, Dr. Donald Barnes, Director of SAB Staff, and Ms. Mary Winston, Staff Secretary. The Committee Roster (incorporated as Attachment B) lists the DWC attendees and their affiliations. A "Sign In" sheet listing other attendees is incorporated as Attachment C.

No member of the public had preregistered to make statements at the meeting per the invitation in the *Federal Register*; and none requested time at the meeting.

CHARGE: Charge information is included at the discussion of the item.

SUMMARY: The meeting followed the Agenda as noted on Attachment D. The following items were discussed and actions were taken as noted.

Thursday, June 18, 1998

8:30a.m.; Convene the Meeting, Dr. Bull, Chairman; and Introduction and Public Disclosures, Mr. Miller and DWC Members

The meeting was called to order at 8:30 am by Dr. Richard Bull, Chairman, who welcomed members, Agency representatives, and the public and then reviewed the meeting agenda.

Mr. Thomas Miller, Designated Federal Officer for the Committee also welcomed the members

and public and asked that the members introduce themselves and to make their disclosures relative to items on the agenda. No conflicts of interest were reported during the disclosures although a number of members chose to mention issues that they wished the public to know about, including: Dr. Moe has conducted human challenge studies with Norwalk virus; Dr. Trussell indicated that his firm has conducted research on various disinfection processes and he was vice chair of an NRC panel that looked at the NCOD; Dr. Pellizzari's firm has received funds to conduct research on certain DBPs; Dr. Dragan participated in an ILSI panel on DCA and chloramines; and Dr. Evans has conducted risk assessments on chlorination byproducts.

9:05 a.m.; Drinking Water Regulatory Program Comments; Ms. Cynthia Dougherty, OGWDW

The Director of the Office of Ground Water and Drinking Water presented an overview of the drinking water regulatory program. She mentioned the historical focus of the committee, the scope of the process for development of national priority drinking water regulations, new programs under the Safe Drinking Water Act Amendments of 1996, priority activities in the area of drinking water standards, the contaminant selection process, the time line for drinking water rules, and some changes in environmental management (reinvention, partnerships, cost-benefit analysis, sensitive subpopulations, and site-specific flexibility) that put the Office of Water in a leadership role for EPA (see Attachment E).

Members asked about the: 1) number of new determinations by 2001 (at least 5); how a chemical might be removed from the Candidate Contaminant List (there is no formal requirement to remove an entry from the list, although one might not be picked up on a subsequent list because others of greater interest displace it--OW desires to have a manageable number of chemicals on the list so it can convey a sense of priority); the legal implications of a decision to not regulate (EPA can be sued over a decision to not regulate). The need for efficient interaction among the SAB and EPA was noted by Dr. Bull.

9:15 a.m.; Drinking Water Scientific Comments; Dr. Tudor Davies, OST

Dr. Davies, Director, OW/Office of Science and Technology commented on recent science assessment plans and activities relevant to SDWA 1996. Dr. Davies mentioned a Notice of Data Availability (NODA) in 1998 as part of the DBP regulations. In this case, new toxicology and epidemiology data became available on a number of DBPs {chlorite/chlorine dioxide, Dichloroacetic Acid (DCA), chloroform, bromate}. The data caused a reexamination of the MCLGs and MRDLGs for chloroform, chlorite, chlorine dioxide, and chlorate. In the NODA, the chloroform MCLG was changed from 0 to 300 ug/L. No changes were made for the DCA or bromate MCLGs. The MCLGs for the chlorite, chlorate, and chlorine dioxide were raised based upon new data that has not been provided to the committee. See Attachment F.

Dr. Davies also mentioned reports that are due to OW from the National Academy of Sciences. The reports are due as follows: arsenic (August 1998), Radon (September 1998), endocrine disrupters (delayed, a joint SAP-SAB review will meet again on this in December). Also discussed were OW's new focus on sensitive subpopulations (e.g., children) that includes a cooperative venture with the George Washington University Medical Center. Alternative test systems are being explored (see later briefing in these minutes). Non-SDWA activities

included a fish contamination advisory, pathogen research and development issues, and surface water criteria (attempting to tie this to drinking water risk).

Dr. Bull asked how Dr. Davies might see the sensitive subpopulation issue coming to the SAB. Dr. Davies indicated that the issue was under the lead of the EPA "children's office' and that he was not sure: he thought that some joint SAB committee interaction would be good. Dr. Dougherty indicated that its use in SDWA rules would bring it to the SAB in specific situations.

9:45 a.m.; **Research Program Comments; Dr. Peter Preuss, ORD**

Dr. Peter Preuss made some introductory comments on the part of the Office of Research and Development. Dr. Preuss stated that the drinking water area was one of the success stories from ORD relative to linking research to policy needs. The Microbial/Disinfection Byproduct Research Plan was offered as the best such example. Policy needs there gave rise to a number of science questions to respond to the need. Those science questions were then addressed by a number of projects to provide methods and data to answer the question. The DWC reviewed the plan and received a response from the agency on the DWC report some time ago. Dr. Preuss stated that the ORD Strategic Plan, of which the M/DBP research area is a subpart, is prepared with an awareness of information contained in a number of recent relevant documents, including the EPA Strategic Plan, ORD's customers, and various review entities. A persistent consideration by ORD is the need to maintain a core research program targeted at broad and long-term issues and shorter-term problem-driven research needed by EPA's operating programs.

Within ORD, the National Center for Environmental Research and Quality Assurance (NCERQA) administers a major grants and fellowships program (STAR) to support EPA strategic goals such as safe water. Dr. Preuss discussed the ORD realignment that positioned the office to support the agencies needs for science to attain EPA's strategic goals. Dr. Preuss indicated that the major water related research in ORD involved M/DBP and Arsenic. He then indicated a number of water research issues within each of ORD's areas of emphasis (effects, exposure, assessment, and risk management). He indicated the need for research to match the scheduling of the Office of Water so that its work could go forward with strong science support. Dr. Preuss indicated that an issue for the current research planning cycle was the candidate contaminant list (CL). A small effort has been started for this area. More needs to be done.

Dr. Ray asked about the status of projects in the M/DBP research plan and remarked on the difficulty in determining which project have been completed and the use made of their results. Ms. Dougherty stated that this would be the subject of another briefing for the DWC this morning. Dr. Bull pointed out that the research efforts for M/DBP and the CCL were not separate and that M/DBP needs would not go away at the five-year point. Dr. Preuss agreed and indicated the need for ORD/OW to begin now to fully define that next phase of research.

10:07 a.m.;**EPA's STAR Research Program; Dr. Peter Preuss, ORD**

Dr. Preuss described the Science to Achieve Results (STAR) program and highlighted items of

relevance to the EPA drinking water program. Dr. Preuss discussed: the programs beginnings; its current funding level (some $110M--some 21 projects have been funded to date in the water area); partnerships with other institutions; and its approaches to communicating research efforts to the broader groups interested in such research through the Worldwide Web, reports, and periodic focused workshops.

Dr. Bull stated that the DWC was interested in learning more of the total research being conducted in support of SDWA and explored the possibility of holding a future DWC meeting concurrent with a STAR water research grants workshop to take advantage of the opportunity to learn more about that research. His intention would also be that such an effort would include overview presentations from other research institutions. Dr. Preuss indicated a desire to have a STAR water research workshop in the next 6 months and indicated an interest in working with the DWC to work out the details of a concurrent effort. Dr. Trussell asked for clarification of the SAB's new "workshop" product and pointed out that the workshop we were discussing was not necessarily of the type that was mentioned in the documents provided about the product. Dr. Bull acknowledged that but indicated that such a target of opportunity was within the scope of what the executive Committee envisioned.

ACTION: Dr. Bull and Mr. Miller will work to organize a future DWC meeting (possibly December 1998) with a one-day segment to hear presentations on various SDWA-relevant research programs. The meeting will be organized to be concurrent with the STAR workshop if possible to take advantage of the opportunity for DWC members to hear more about SDWA research than might be otherwise possible.

10:35 a.m. **BREAK**

10:50 a.m.; **Final Microbial/Disinfection Byproduct Research Plan and Research Tracking System--Information Briefing; Dr. Bruce Peirano, ORD and Mr. Michael Cox, OGWDW**

The agency submitted a draft research plan to the DWC and the committee provided comments on that plan during FY 1997. The agency published a final research plan during December 1997. Dr. Peirano briefed the DWC on the final plan (see Attachment I_1 through I_5). Dr. Peirano discussed the chronology of the planning effort, the overall problem that the plan addressed, the research goals supported by the plan, the structure of the final plan which was modified to reflect DWC comments, new resources devoted to M/DBP efforts since the plan was developed, and an example of a revision to the plan that reflected the Agency's response to the DWC comments.

DWC members asked about the status of EPA's internal resource commitments to microbial research (ORD is adding two assessors to the NCEA staff and OW is adding as many as 5 in OS&T; OW increase is now focusing on the 'beaches risk assessment'). Dr. Evans asked if there was a current statement on the Agency's understanding of the specific problem. Mr. Cox stated that the 1994 and 1997 rulemaking notices lay out the problem in detail. Ms. Dougherty noted that the research agenda grew from EPA's advisory committee interactions with stakeholders that essentially agreed that the first phase of rulemaking would proceed with existing data and the next phase would be based on new information resulting from the

research to be conducted under the plan. Dr. Ray asked if the $10M added by the ammendments actually had made it to the research program. Mr. Cox stated that it had and that it was split between DBP (most) and microbial research (lesser amount); however, he was not able to clarify the exact split between the two major areas. Most M/DBP research is of the problem-driven type as contrasted with 'core' research. Ms. Dougherty noted that some shifting of resources can be accomplished by the annual planning exercises between ORD and OW. Dr. Trussell noted that the DWC had seen the M/DBP research plan a number of times and he complimented the agency on the final version's linking the research to the need. Dr. Bull asked if EPA had an influence on the non-EPA research under the plan. Mr. Cox mentioned a numbe of mechanisms to do so.

Mr. Michael Cox discussed the M/DBP Research Tracking System that has been established to retrieve pertinent information relating to completed, ongoing, and proposed research projects on microbial pathogens and DBPs. Using a computer projection, Mr. Cox introduced the system, showed the coding used, and then demonstrated how various searches could be executed.

Members remarked on the difficulty in getting information from European researchers as likely being tied to the sense that it is proprietary; and the accessibility of the data base (Mr. Cox provided copies of the database on CD-ROM to the members; available to others in this way as well); the update frequency for the database (intention is 6 month intervals). Dr. Moe noted that she had discussed such research with scientists at the Centers for Disease Control and they had no awareness of the database. She volunteered to be a conduit to get copies to the appropriate CDC individuals.

11:45 a.m. **LUNCH**

1:00 p.m.; **Alternative Test Systems to Evaluate DBPMixtures-A Consultatiion; Dr. Rita Schoeny, OST**

Dr. Schoeny identified a need to assess the toxicity associated with exposure to DBP mixtures to the Stage 2 DBP rule scheduled for May 2002. She noted that in general two approches are taken to looking at DBP toxicity; one a top down approach tests complete mixtures and the other, bottom up, tests individual chemicals and in essence adds their dose or response to evaluate their toxicity in mixture (see Attachment J).

This effort is exploring the use of Fetax and Medaka assays in a top-down approach. OW is conducting this work in collaboration with AWWA, US Army Center Environmental Health Research Division, and the NIEHS. The presentation focused on the frog embryo teratogenicity assay - Xenopus (FETAX) to assess potential developmental toxicity of chlorinated drinking water mixture samples. The first results are expected in the summer of 1998. The agency is interested in the first reactions from the members on this approach. EPA will bring the issue back to the DWC for a full review once completed.

Member reactions included: 1) questioned whether adducts would be measured (no); 2) noted the instability of chlorine in samples shipped overnight; 3) noted Xenopus' capacity for DNA-repair that might result in false negative responses to some chemicals; 4) asked whether

disinfectant residuals at levels found in drinking water might cause an effect during the test; 5) noted that explicit consideration be given to how the data will be used in developing regulations before one attempts to make general use of these tests; 6) noted the need to think about thresholds of sensitivity; 7) noted that using the results to decide if the sum of the risk of the components of the mixture are greater than risk predicted for the parts, you have a more useful result, 8) make sure that the possible results would be meaningful if used in risk assessments to set policy, and 9) additional complications in this assay when you add enzymes during testing.

Action: Tom Miller is to provide a notice of Consultation to the agency on this topic.

2:00 p.m.; **Drinking Water Contaminant Occurrence Data Base-an Advisory; Mr. Charles Job, OGWDW**

Mr. Job stated that the scope of the National Drinking Water Contaminant Data Base (NCOD) is to collect data of documented quality on unregulated and regulated contaminants in finished, raw and source waters of public water systems of the US. Other potential data types include ambient monitoring data and data from research and special studies. The NCOD is intended to support the identification and selection of contaminants for future regulation, regulation development/modification, and to inform the public about contaminants in drinking water.

Mr. Job discussed the NCOD principles considered by the agency in developing the NCOD (includes data on regulated and unregulated contaminants, in electronic form, must support decisions with links to public health data bases, must have high quality data for decisions/lesser for contaminant selection; stakeholder involvement necessary; NCOD must build on existing data sources; reporting requirements will be specified by regulation; should include only data for specific user requirements; must use existing technology--refinements can come later). The NCOD has been the subject of a number of Stakeholder meetings that have influenced the strategy developed for the database and technical characteristics of the database.

Major emerging directions for NCOD include: the need for good locational data for relating health assessments to populations, public access will also require good locational data; more complete monitoring of ambient monitoring results; monitoring locations may need to be contaminant specific; non-detection data is not to be separated from detection data; technology is changing rapidly thus new opportunities may be available in the future; data of different quality may be accepted (and tagged) to allow for a more robust data set in the NCOD.

EPA is developing an analytical plan to apply to the database for use in contaminant listing, contaminant selection and regulation. This will include statistical analysis, geographic analysis and exposure assessment input.

The database is being compiled to answer the following questions: 1) contaminant identity; 2) concentration of contaminant found; 3) where found; 4) when found; 5) what is the type of water source; 6) is the occurrence associated with water treatment; 7) at what level is the contaminant a health concern; 8) how many people are exposed; 9) is there a co-occurrence

with other contaminants; 10) why was the sample collected; 11) what is the level of confidence in the concentration measure?

The agency questions for the DWC included:
1) Are the data elements included for Sample Test Results (in the Attribute List) adequate for scientific analyses, recognizing that more detailed data will still be stored by laboratories?

2) What types of results should be reported for peer review by the scientific community relative to regulatory decisions? How should these results be reported. (I.e. what results from analyses conducted under the Analytical Plan should EPA have peer reviewed?)

Member comments:
1) can poor quality data be purged later? (Intention is not to put in poor quality data from the start).
2) will historical data or only prospective data be captured? (Now assembling existing; as new data comes on line we will add it using even more stringent acceptance criteria)
3) how will 'high quality' be defined? DQOs? (Not there yet; we are looking at DQOs now; may look at detection levels, reporting levels)--Dr Trussell noted that this could delete labs with a conservative mindset and accept those making extravagant claims.
4) will the database indicate anything about the sampling plan used in generation of specific data? (A pick-list will provide entries for reasons collected)
5) will the database say anything about the existence of remediation activities that could influence levels over time?
6) will there be a reliability rating indicator in the database for data entries? (Yes, we'll tag data sets as to their reliability).
7) has the agency considered the implications of the generality that you obtain the largest portion of the database's benefits from a small core of data and that greater marginal expenditures are needed to obtain the final increments of data beyond that large core?
8)Has the agency considered using a number of small databases instead of one large one? (We see the task as making marginal changes to existing systems instead of actually building a large new system).
9) Will it be clear when a change has been made between water sources by the system? (No).
10) Thinking that only capturing some smaller amount of data and having access to more thorough data that is stored at laboratories is not realistic (See charge question 1--Trussell).
11) Given the larger uncertainty in toxicity issues, why is it so important to push for high quality exposure data? Consider whether an analysis would change enough to drive a different regulatory outcome in determining how good the exposure data captured needs to be. Also consider the cost to acquire such data; if it is trivial, it may be fine to go after better data but if it is high and you are only fine-tuning an analysis, it may not be worth going after--Evans. The agency may be asking for more than you need--Bull. (The agency hopes that the additional data may make its decisions more defensible).
12) How does the agency keep up with changes in analytical methods used to generate the data? (This will be indicated in reference tables).
13) For the Attribute list, what is to be considered? (EPA wishes the DWC to consider those elements listed as "Sample Test Results" and advise the agency on whether they are sufficient for sound science based decisions; should EPA ask for more?)
14) The minimum data needed has more to do with data representativeness than the number

of data elements themselves; what populations are included/excluded in various data; what type of sampling was used?--Bull
15) EPA should do some case studies using the analytical plan to evaluate whether it is capturing sufficient data for its needs.
16) Data entry control is an important consideration in utility of the database. What reporting requirements will you have? (There will be data acceptance criteria for what is acceptable).
17) What is the unique role of the DWC relative to other groups who have looked at the NCOD? (The DWC is being asked to comment on the soundness of the data set we are suggesting as necessary for support of decisions.)
18) It may be more important to focus on future data collection instead of trying to get too much out of old data that might compromise your system.
19) Who are to be the users of the data? (Anyone, but the search engine is being designed for EPA as the user; public access will follow.)
ACTION: The DWC will prepare an Advisory to the Agency on this topic. The first draft is to be completed by Drs. Trussell and Evans for tomorrow. The DFO will compile the pieces into a draft Advisory format for circulation, comment, and approval by the DWC.

3:50 p.m. **BREAK UNTIL 4:00 PM**

4:00 p.m.; **Comparative Risk Framework Methodology and Case Study-a Planning Session; Dr. John Bukowski, NCEA-Cincinnati**

This session was conducted via teleconference with EPA/NCEA-Cinn representatives (Drs. Bukowski, Papa, Harvey, Rice, Brown, Brenda Boutin, and Patricia Murphy).

DBPs are an unintended byproduct of drinking water disinfection. This presents a problem of comparing competing risks; microbial risk (common, usually mild, certain, but sometimes fatal) and risk from DBPs(dire risks but uncertain) that form when we control microbes. Dr. Bukowski introduced a framework for the systematic assessment of the impact of alternative public health policies, programs, and practices on health outcomes using decision analysis (DA) coupled with economic analysis. Collectively, this prevention effectiveness analysis (PEA) hopes to identify options with the best cost-benefit or cost utility ratios. As contrasted with cost-benefit analysis, cost-utility analysis will provide answers that are not in dollar terms. The outcomes are utility functions that can be interpreted in terms of how much of a year a person would choose to give up to live in perfect health.

Criticisms of DA/PEA included the time it takes to conduct, high uncertainty, lack of flexibility, and the potential for dehumanizing the decision-making process. These were asserted to be problems with risk based decisions as well and that the output of the analysis is to be taken as only one component of decision-making. However, DA/PEA was suggested to be beneficial to aid decision-making, to provide a logical analytical framework, to ensure comprehensive thinking is applied, to make the process transparent, to provide a common metric for comparison, to characterize uncertainty, and to identify areas for needed research.

The agency asked that a full review of this method and a case study be scheduled for September, 1998. Areas of expertise needed for the review were suggested as: decision analysis (Evans), epidemiology (Moe), drinking water treatment systems (Trussell, O'Melia),

chemical mixtures toxicity/risk including DBPs (Bull, Davis, Dragan, Ray), infectious disease/ microbiology (Moe, Yates), general risk assessment (Evans), health economics (TBD), and statistics/modeling (Bean, TBD).

Member comments and questions:
1) Where do the probability values come from? (From the literature or expert judgment).
2) Expert elicitation is very difficult and there is much variability.
3) How do you put a limit on the unknowns so that you can distinguish among the various alternates?
4) Averages are not appropriate for looking at microbial disease; events are more appropriate; such problems are event-driven.
5) Concentrating on Cryptosporidium may be an improper assumption. (That is being used for illustrative purposes. We may use different ones in the application document.

Charge: 1) Review the approach proposed; are elements lacking or incomplete;
2) Evaluate the assumptions used in the approach in the decision tree (e.g., efficacy of Cl vs. Ozone).

Timing: The agency needs the review in September and the report by the end of November 1998.

The draft must be to the DWC by mid-August.

Action: Miller and Bull will identify and obtain additional panelists for the review and schedule the meeting.

4:30 p.m.; **Writing Session for the Day's Activity; DWC Members**

a. STAR Workshop: The members agreed to have the Chair and the DFO follow up with Dr. Preuss to put together a DWC meeting with a one-day research focus concurrent with the to be scheduled STAR water research workshop. The intent is for information gathering for the DWC members regarding research underway relative to drinking water.

b. NCOD Advisory: Drs. Pellizzari and Trussell will draft the advisory for circulation to the DWC membership.

C. Affordability Criteria: Tomorrow. The consultation may not be enough. The members will consider doing a Commentary during the discussion tomorrow.

5:22 p.m.; **Adjourned for the Day**

Friday, June 19, 1998

8:30 a.m. **Affordability Criteria and Technologies for Small Systems-a Consultation**
Mr. Jeffrey Kempic, OGWDW

The 1996 Safe Drinking Water Act (SDWA) requires EPA to re-examine the existing

regulations and identify technologies that are appropriate for small systems. EPA will identify affordable **compliance technologies** for three categories of small systems: 25 - 500 people, 501 - 3,300, and 3,301 - 10,000 people. When an affordable compliance technology cannot be identified, based on system size and source water quality, EPA will also identify **variance technologies**. For the rules where small system variances are prohibited by the SDWA, EPA will only identify compliance technologies and Affordability will not be a factor. The list of compliance technol-ogies for the surface water treatment rule is due in August 1997. The lists of compliance and variance technologies for all of the other existing regulations is due in August 1998. Variance technologies only apply when there is a system size/source water quality combinations with no affordable compliance technologies listed. (See attachment M).

The primary role of the national-level affordability criteria is to direct a system exceeding the MCL into either a **compliance technology pathway** (pay now approach) or a **variance technology pathway** (two mutually exclusive pathways), it does not select a specific technology for a specific system (even systems meeting the national level affordability criteria may not have an affordable technology at the level of a specific system). If the national-level affordability criteria are set very high, then the variance technology pathway will be limited or eliminated and systems will need to install compliance technologies. If the national-level affordability are set very low, the compliance technology pathway will be limited or eliminated and more systems will operate under small system variances. Options for proceeding, other than compliance right away, include as well "**exemption then compliance**" (pay later), "**small system variance**" (pay less for less), and "**exemption then small system variance** " (pay less later for less approach). Mr. Kempic pointed out that there is no "no-cost" alternative. Its either compliance technology or variance. He also noted that variance technologies would likely have a higher level of process control monitoring than for compliance technologies.

Key components of national level affordability include: 1) user burden (e.g., $/hh/yr increase), 2) existence of financial assistance from other than water users--though this is not considered in the approach developed, 3) knowledge that user burden alone as a criterion could act as a barrier against technology, and 4) difficulty for a system to install a technology that did not meet the affordability criteria.

In developing its income-based measures of affordability, the agency looked at baseline annual water bills for single residential and non-residential customers from the 1995 Community Water System Survey (CWSS), water consumption levels, expenses and revenue for systems of various sizes and water sources, annual household water costs, median household income (MHI) based on linking the CWSS and 1990 Census data, and comparative household expenditures as % of MHI.

Questions that the agency is working to answer include: 1) is the link between household cost increases and media household income the best measure of affordability in CWS; 2) what is the best measure of affordability for NTNCWS; 3) should EPA use a 'bump' to account for financial assistance since the method can't directly measure it; 4) use of separate baselines for groundwater and surface water systems and public vs. private systems; 5) additional methods to estimate current annual household water bills; 6) household consumption level to use to evaluate treatment cost; 7) other mechanisms to estimate MHI; 8) is the mean or the median the appropriate measure for water sales revenues/MHI/consumption; 9) should other utilities

be part of the comparisons; 10) are residential users the most vulnerable?.

Mr. Kempic stated that the National Drinking Water Advisory Council recommended an approach to affordability based on development of general cost information for various technologies to be used as a yardstick to permit comparison and bench marking of each technology against the other without prematurely eliminating technologies and development of income-based affordability criteria that can be applied to individuals systems in various size categories.

Charge: OW requested a consultation on their approach to setting the national-level affordability criteria.

What is the SAB's opinion on the components that EPA has included in the national-level affordability criteria?

What is SAB's opinion on EPA's measure of national-level affordability?

Are there better alternatives?

Members commented as follows:
1) Dr. Ray noted for the committee that the agency should be complimented on this effort. It has been significant.
2) Members would like to receive information on the unreasonable risk to health (URTH) risk construct.
3) The concept of affordability needs to be explored via the economic literature. The lack of a definition in the act does not mean that there is not some useful information in the literature. The concept of 'marginal willingness to pay' is well defined in the literature. Did you look at using this as an interim approach? The agency's documentation says much about cost but little on what affordability means. A small amount to a good economist may result in a literature review or a statement on the state of the science that can help you with this.
4) Focus on median ignores the disproportionate burden on those at lower levels of income. Did anyone look for any information on elasticity of demand for drinking water?
5) Drs. Clesceri and Trussell asked for copies of the 1995 Community Water System Survey report.
6) Members pointed out the hazard in comparing affordability of water system increases to things considered virtues and vices (e.g., alcohol, tobacco)--trying to justify increase via a normative route is hazardous.
7) The bottled water comparison may not reflect anything to do with water quality. It may say more about convenience.
8) What groups were included in the Stakeholder groups involved with OW in developing the criteria to date? (States, water industry, equipment manufacturers; no environmental groups participated).
9) What are the agency's next steps? (For now EPA will continue its evaluation; it is trying to identify variance technologies; only 5 have been identified).
10) Does the Agency intend to bring the criteria back to the SAB for a look in the future? (The Agency is considering this. No decision is yet made.).

Action: The DWC will prepare a short commentary to the Agency on this issue. We will do

this as rapidly as possible via an email review.

10:30 a.m. **BREAK**

10:45 a.m.; **Drinking Water Intake, a Consultation; Dr. Julie Du, OST and Ms. Helen Jacobs, OST**

Dr. Sharon Mickle, US Department of Agriculture served as a resource person for the DWC on this consultation. Dr. Mickle is involved the development of the USDA's Continuing Survey of Food Intake by Individuals (CSFII).

Dr. Julie Du stated that the SDWA requires EPA to set MCLGs to protect the US population from adverse effects from exposure to drinking water contaminants. Water consumption rates are used in MCLG calculations and in Health Advisories. The goal of this project is to generate up-to-date estimates of water intake. The agency is using data in the UDSA's Combined 1994-96 Continuing Survey of Food Intake by Individuals to develop its drinking water intake estimates. Past estimates were based on data from the 1977-78 National Food Consumption Survey of USDA. The water consumption tables to be developed by the Agency will be used for a wide range of applications (see Attachment N).

Ms Jacobs stated that the project objective was to develop drinking water consumption estimates (municipal tap and bottled water) with percentile distributions by age, gender, race, socioeconomic status and geographic region and separately for pregnant and lactating women.

The CSFII survey was designed to produce a complex, stratified, multistage, area probability sample of persons residing in households across 40 domains defined by sex, age, and income level. The survey over sampling focused on low-income populations, children and the elderly. A household questionnaire was used for data collection. Water use was recorded for cooking and preparing beverages (indirect water), plain drinking water (direct water), and water in foods and beverages when purchased (intrinsic water) as was the water source. The dietary questionnaire covered 2 nonconsecutive days of 24 hour dietary recall. Overall, the CSFII had a 76% response rate--probably tied to the built in incentives used in the contract covering the effort (Mickle). Three CSFII databases were used for water estimates: Food Coding Database, Recipe File, and the survey Nutrient Database.

Office of Water estimates include average per capita (by source): direct water consumption, indirect water consumption, and total water consumption for a variety of age groups, demographic groups, and regions. Point estimates, means, and a variety of percentiles are to be generated.

Ms. Jacobs identified a number of issues:

1. Selection of the 94-96 CSFII for estimating per capita water consumption
2. Exclusion of intrinsic water from the analysis
3. Use of a short term survey to generate a distribution of consumption.

Charge: The agency will consult with the DWC on the applicability of the source data set;

the need for additional estimates; assumptions used by the agency; and questions regarding intra-individual variation.

The agency is now asking SAB for a reflection to see if it is on the right track. It hopes to bring the report to the DWC later for a full review.

Member Questions and Comments:
1) Dr. Bull asked whether the magnitude of change in the possible drinking water intake levels would influence the MCL derived by the agency. (Dr. Du indicated that intake indeed could do that on some specific chemicals, subpopulations, or endpoints).
2) Where on the distribution is the MCL set? (It is to be set as close to the MCLG as possible given; SDWA also requires OW to look at sensitive populations.
3) Dialysis and diabetes patients are subgroups that have much different water use than the normal population.
4) The degree of specific subpopulation over sampling in the survey is important because it influences the information collected in the survey on other subpopulations.
5) Cooking water is often drained off and in some cases this means contaminants are removed, in others they may be transferred to the food itself, and for microbes, the contaminants may be killed. Some data show that as much as 90% of some pollutants may transfer to food during cooking.
6) Regarding use of the short term survey to represent 'usual intake':
-If you have high autocorrelation between first to second day dat then you can get to annual estimates easily.
-There is a possibility of getting an 'unusual' estimate as well and you need to be aware of the possibility.
-Dr. Evans was supportive of the Agency's possibilities for getting a handle on variability in this method.
7) The use of the information during regulation should influence how you develop the data. You may want to look at some sensitive subpopulations up front to see if the method does answer the questions that are important to future regulations.

Action: Send a thank you letter to USDA for Dr. Mickle's participation.
Develop the needed documentation to reflect the conduct of the Consultation.
Schedule a full review for December 1998 with a full report to be sent to OW in early 1999 (two-month turnaround desired).
Obtain supplemental consultants for the review.

12:15 **LUNCH**

12:45 p.m.; **DWC Planning Session**

The DWC members tentatively identified dates for future meetings. The primary date for the September meeting is 9/17-18 and the backup date is 9/24-25. The tentative dates for December are 12/7-8; however, they conflict with the Society for Risk Analysis annual meeting so we will look for a better date at our next meeting.

The members summarized points to discuss with program office representatives in the debrief session to be held later in the afternoon.

1:30 p.m.; **Program Debriefing; Ms. Elizabeth Fellows, Deputy Director, OGWDW and DWC Members**

Attending for OW were Ms. Fellows, Mr. Michael Cox, and Mr. Chuck Job.

1. NCOD:

Dr. Pellizzari commented that:
-Data needs should flow from an analysis of how the data will be used.
-A mock case could help develop procedures for use of data, and give structure to parameters for the system.
-This would also help to determine data quality needed.
-You should develop the analysis plan with the help of treatment engineers, microbiologists and other specialists who will do the analyses.

Dr. Trussell commented that:
-The Agency recognizes that t the NCOD provides an opportunity to establish data quality standards for completeness; prospective data would be better than retrospective
-In sampling points, fixed highest priority is important to the design; don't collect everything out there; decide what will be important for your use.
-State data based on standard methods is better than other types of data. Ms. Fellows noted that some are pushing the agency to use performance based methods (those that meet a certain set of performance criteria). Some members are concerned with this approach; however, the DWC itself did not discuss this aspect.
-Special attention to sample compositing; microbial methods; it is not clear how much microbial information is included.

Dr. Evans commented that:
-Linking of this database with population databases, to ensure it can be done, is important if you want to use it for exposure; how good you need the data to be is important.

Ms. Fellows stated that it is better to think of NCOD as an analytical tool instead of a database. Our up front planning is important and in some ways precedent setting for EPA.

2. Affordability Criteria

Dr. Evans commented:
This is a very good effort to identify costs and attribute it to household level; however, the Congress left EPA with a big problem with the concept of 'affordability' by not defining the term in the law. The Agency might be helped in this by obtaining a few economic consultants to prepare a short explanation of how the literature may help EPA in this regard. In a short time a consultant might be able to tell EPA if it has done

about as well as can be done or they could provide some better directions to follow. The DWC can not provide much guidance in this regard.

The comparison to alcohol and tobacco uses is not a good idea. It puts you into moral judgments and it could be hazardous. You might look for other comparisons to support the legitimacy of the increase.

Dr. Trussell commented:
In the report, many statements reflect judgments that have been made; however, they are not discussed in depth in the report. You should identify those statements that are most important to your case and insure that these are well supported.

3. Research Planning

It would be informative to be able to link the research plan to resource usage and the results being obtained. The DWC will try to learn more of the full spectrum of research underway at its winter meeting (STAR, ORD, OW, AWWARF, and others). The intent is to see where things are. We would focus on M/DBP now and hope to expand the scope later.

Ms. Fellows indicated agreement with that need and mentioned that there is now a pending lawsuit seeking information on how the $10M added for research by SDWA 1996 has been used.

Mr. Cox stated that there is a stakeholders meeting in December on Health Effects.

4. Other questions:

Dr. Yates asked if the Ground Water rule would be coming to the DWC. Mr. Cox indicated that there is a March proposal due. OW intends to bring the issue to the DWC for review at the proposal stage.

2:35 p.m. **The meeting was adjourned**

I certify that these minutes are accurate to the best of my knowledge.

/ S /

Dr. Richard Bull, Chairman
Drinking Water Committee

/ S /

Thomas O. Miller
Designated Federal Officer
Drinking Water Committee

[F:\USER\PTHOMAS\DOCS\INTERNET\MINUTES\99MINUTE\DWMIN698.DFT]